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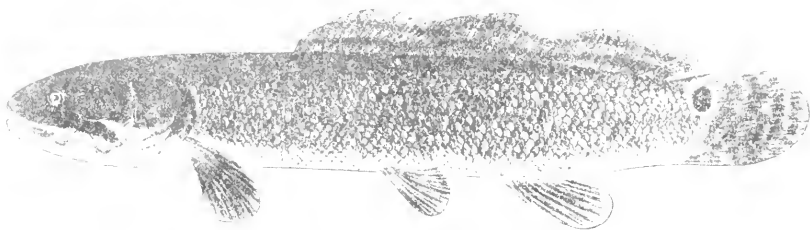
Economic Circular No. 26, Revised

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THE BOWFIN:

An Old-Fashioned Fish With a New-Found Use.^a

Peculiar interest often attaches to things distinctively old-fashioned or to relics of the past—antique furniture, ancient temples, ancestral customs. So among natural objects we find a fascination in patriarchal trees, immemorial rivers and waterfalls, beds of ancient seas, or remains of prehistoric animals. We gift them with powers of memory; we fancy they could tell wonderful stories. Here in our American fresh waters, at least where they are most quiet, we find an old type of fish. Many persons catch it who do not really know it. They find it taking their bait and eating other fishes. They call it a nuisance, a wolf in the sheepfold. They speak of its "ferocious looks and voracious habits." Others take it who know its place in the fish world. To them it is of wonderful interest, because it is both



primitive and modern. Take its swim bladder, for example. In ordinary fish this is a simple sac to give buoyancy to the body; in the bowfin it is something like a lung, for this fish can rise to the surface and literally "take a breath of air." There are other parts that remind us of the primitive soft-skeletoned fishes of the seas. Yet the bowfin has taken to itself modern parts, such as scales that would grace the most modern member of the tribe.

No wonder that it puzzled scientists until they catalogued it in an order and family all its own and disposed of it with a Latin name, *Amiatus calurus*. No wonder, either, that ordinary mortals expressed their bewilderment with a prodigality of names, such as bowfin, grindle, John A. Grindle, dogfish, mudfish, lake lawyer, poisson de marais, marshfish, blackfish, choupique, cypris trout, willow pike—but that is enough.

What is the bowfin? We can not compare it, because it has no near relatives in this country or in any other part of the world. It is

^aBy R. E. Coker, assistant in charge of Scientific Inquiry, United States Bureau of Fisheries. The illustration is after Forbes and Richardson (*The Fishes of Illinois*).

found only in North American waters. Its next of kin found rest from the labors of fish life some millions of years ago. This was in times that the geologist calls Mesozoic. To modern fishes it is a sort of surviving ancestor. It deserted its proper contemporaries to continue the battle of life in competition with modern descendants of the ancestral stock. It plays no mean part in the present struggle for existence among fishes, as every angler and commercial fisherman can testify. It is true that ages long past witnessed the disappearance of this peculiar form from European waters; but in America, even down to this time, the bowfin positively declines to be elbowed out of the way, not even by fishes that seem more fitting to the present day and more acceptable to the modern palate. In every lake, pond, or bayou that it chooses for its home the bowfin holds its own against all comers—vigorous in competition and voracious in depredation.

As in the case of many other kinds of fish that are generally condemned, but for lack of commercial value are little sought, it has gained an increasing advantage over its more esteemed contemporaries. Having been termed "useless and obnoxious," it was let severely alone. All this we might imagine to be very pleasing to *Amiatus*, for nothing so coincides with the ambition of any living form as to be allowed to multiply and replenish the earth, or the waters, with its own race. Meantime, of course, it devours the offspring of other races less favored of fortune because more favored in the market.

We have now learned that the bowfin need not be held in low regard as an article of food, and accordingly as an object of commercial pursuit. After subjection to a very simple and practical method of salting and smoking it becomes a real delicacy. The soft, pasty flesh has been regarded as objectionable in the fresh bowfin, but in a smoked fish nothing is so desirable as this smooth, cheesy texture, which almost permits the meat to melt in the mouth. A rich, clear flavor is also imparted by the process of smoking. Even those persons, therefore, who have been decidedly prejudiced against the bowfin, as, indeed, are practically all who have known the fish without smoking, have pronounced the smoked product equal or superior to any other smoked fish.

Where and how is the bowfin found? A lover of sluggish waters, it is abundant in the Great Lakes region, in the Mississippi Valley from Minnesota to Louisiana, and in the east from New York to Florida. It seems to like the weedy waters, frequenting the shallows at night and returning to the deeper places by day. In some localities it is best known to those who fish by night with the jack lantern and spear. In one Wisconsin lake bowfin were found during the winter so closely huddled in gravelly pockets among the water weeds that two at a time were often impaled on a spear.

So shallow is the water chosen for nesting purposes, and so absorbed are the fish in their family responsibilities, that in some places a common mode of capture, for fun or for food, is to wade out in the marshes where the fish are nesting, approach slowly and cautiously, and seize the victim with one's hands. Presumably, it is principally the males that are taken in this way, for it is they that bear the burden of guarding the eggs and nursing the young.

The bowfin may be captured commercially by means of the fyke or hoop net or by the seine, but the baited set line is probably the most effective method. When seines are used it must be remembered that this strong fish can make a remarkably quick "get-away," disappearing beneath the vegetation or in the soft mud. When captured with the hook and line it is described as "one of the hardest fighters that ever took the hook." It is indeed entitled to be gamy, for it is one of the most rapacious of our fishes.

With its strong, sharp teeth, a bowfin has been known to bite a 2-pound fish in two at a single snap. Apparently it is active and feeds the 24 hours of the day. Its food is principally fish, crawfish, and mollusks. It is said to leave dead fish unmolested; surely one can take no exception to the bowfin from the quality of its diet.

The bowfin, then, offers us an instance of a fish which is abundantly able to take care of itself so far as regards its competitors and the conditions of its environment. As long as we eagerly seek the other fishes and discard the bowfin, we are working to give it an increasing preponderance over species which earlier found a place in our esteem. Accordingly, two purposes are to be served by a proper utilization of the bowfin. In the first place, a fish that has been largely wasted is made useful and a new item added to our already too limited supply of food; in the second place, a regular fishery for bowfin will tend to restore and to maintain a proper balance between this and other species that dwelt together and in competition before man began to disturb natural conditions.

A word to the purchaser. The distribution of the bowfin is such that the supply in local markets need not generally be brought from great distances. It may be expected to reach the markets of large cities, but the fish seems peculiarly adapted to meet the requirements for a home-made or local-made product in cured fish.

The methods of preparing the bowfin by salting and smoking may be described as follows:

METHODS OF CLEANING AND SMOKING BOWFIN.^a

The fish is scrubbed lightly with an ordinary scrub brush to remove slime and dirt from the scales, but the scales are left on. The head is severed, a slit

^a The methods were developed by J. B. Southall at the Fisheries Biological Station, Fairport, Iowa. The use of fish from very warm water is not recommended. In many localities, therefore, especially in the South, smoking should not be attempted during the summer months.

made along the belly to the vent, and the viscera removed. After the fish is cleaned and washed the ribs are cut on both sides of the backbone and the latter is removed. The dark mass of the kidney will be found back of the vent and should also be removed.

When thus dressed the fish are ready to be dry salted, a method superior to brine salting because it makes the fish tougher and better able to be suspended from the hooks in the smokehouse. A layer of $\frac{1}{4}$ salt is sprinkled on the bottom of a tub, a layer of fish placed scale side down on the salt, a layer of salt placed on this, another layer of fish placed on the salt, and so on.

The fish remain in the tub overnight, or at least 12 hours. They are then washed and placed in water for about 1 hour to freshen them; this process may be hastened by changing the water four or five times at intervals of 10 minutes. They are then placed on wire trays to dry.

When the surface moisture has disappeared the fish are suspended by **S** hooks in the smokehouse.^a They are smoked with considerable heat for 4 or 5 hours and then with less heat but an abundance of smoke for 15 to 20 hours. Hickory or other hardwood fuel or the shavings from furniture or wagon factories are preferred; corncobs may also be used. After the smoking is completed the fish are left in the smokehouse until cool, thus preventing sweating, which may occur if they are taken out while warm. Sweating is one of the principal causes of the growth of mold.

Splitting along the belly is said to leave the thick, soft meat on each side of the backbone less exposed to the drying effect of the smoke and in better condition. This meat near the backbone is the real delicacy, although the rest of the flesh is of excellent flavor. An objection to the belly-splitting method is that the outer edges tend to curl, but this can be obviated, if desired, by pressing the fish between pieces of coarse wire cloth tied together at the edges. If back-splitting is preferred, the knife should be kept close to the backbone on each side, removing the bone with as little waste as possible.

If kept too long, any smoked fish is liable to mold, but it can be protected both from mold and from attack by ordinary pests by dipping in melted paraffin, which, when cooled, forms a protective envelope. The paraffin is easily removed by immersing the fish for a few moments in hot water.

RECIPES FOR SMOKED BOWFIN.

Many persons like the smoked bowfin best when served cold and without additions except for the purpose of garnishment. It can, however, be prepared for the table by most of the methods applicable to other smoked fish. Some of the simplest and most satisfactory as well as some of the more elaborate modes of preparation are suggested by the following recipes. Except as otherwise noted, these recipes have been prepared by the Office of Home Economics of the Department of Agriculture.

(NOTE.—It is suggested that smoked fish be first wiped with a clean, damp cloth.)

Panned bowfin.^b—Place fish, opened and spread out, in pan. Dot with generous lumps of butter, and add a little milk. Place in oven until thoroughly heated through. This makes a delicious breakfast dish.

^a The construction and operation of the smokehouse is described in the Bureau of Fisheries Economic Circular No. 27, Revised.

^b Contributed by Miss A. W. Stearns.

Baked bowfin in paper.^a—Wrap one bowfin (average size fish) in one or two thicknesses of paper (preferably the brown paper used by butchers), place in a pan and put in a hot oven for one-half hour. The fish is thus thoroughly heated without being dried out. Before serving remove paper wrapping and the skin of the fish.

Broiled bowfin.^b—Place bowfin on gridiron, flesh side down, over glowing fire. When broiled remove from fire and coat with melted butter.

In all the recipes that follow the bowfin should be skinned and the head, tail, fins, and bones should be removed. If the fish is too salty, soak in water until the excess salt is removed.

Boiled bowfin.—Prepare fish as directed above. Boil, in enough water to cover it well, for 15 or 20 minutes.

Creamed bowfin.—To about 1 pint of hot boiled bowfin, broken in pieces, add 1 cup of cream sauce. Mix the sauce and fish together well. Serve on toast.

Smoked bowfin patties.^c—Take 2 cups ground fish, 2 cups cracker crumbs, 1 egg, and one-half cup milk or cream. Beat egg, add remainder of ingredients, and form into patties. Put equal parts of butter and lard in skillet, and fry to a golden brown. Serve on hot platter garnished with parsley.

Creamed bowfin on toast.^c—Take 2 cups milk or cream, 2 tablespoonfuls of flour, and 1 cup smoked fish cut into small pieces. Boil milk and flour, then add fish. Serve hot on toast.

Smoked bowfin salad.^c—Take equal parts of smoked bowfin and celery, cut into small pieces and add 1 cup of nut meats. Pour over this mayonnaise dressing to which whipped cream has been added.

Smoked bowfin with sour sauce.—To about 1 pint of hot boiled bowfin add one cup of sour sauce; mix well and serve hot on toast. Sour sauce: 2 tablespoonfuls butter, 2 tablespoonfuls flour, 1 cup milk, 2 tablespoonfuls vinegar, $\frac{1}{2}$ teaspoonful mustard, $\frac{1}{4}$ teaspoonful pepper, $\frac{1}{2}$ teaspoonful salt. Melt the butter, add the flour, and cook 1 or 2 minutes. Stir in milk slowly, and cook till thick, stirring constantly. Warm the vinegar and very slowly pour into the sauce, stirring hard all the time. Season with salt, pepper, and mustard.

Bowfin soup stock.—3 cups stock (fish); 1 cup water; 3 potatoes, diced; 2 teaspoonfuls lemon juice, $\frac{1}{4}$ teaspoonful pepper; 5 carrots, sliced thin; 3 thin slices onion; 1 stalk celery, chopped fine. To 3 cups water in which bowfin had been boiled 15 minutes, add 1 cup water. Add potatoes, carrots, onion, and celery and cook until vegetables are tender. Add lemon juice and pepper. Serve hot with croutons.

Bowfin mush balls.—2 cups finely shredded boiled bowfin, $1\frac{1}{2}$ cups mush made from soy-bean meal or cornmeal; 2 eggs, well beaten; $\frac{1}{4}$ teaspoonful pepper; $\frac{1}{4}$ teaspoonful celery salt. Mix together all the ingredients in the order given and roll into balls. Roll balls in crumbs, then in beaten egg, then in crumbs again. Fry brown in deep fat. Serve hot with or without tomato or egg sauce.

Escalloped bowfin.—1 pint boiled bowfin, 2 tablespoonfuls flour, 3 tablespoonfuls butter, $1\frac{1}{4}$ cups milk, 1 teaspoonful salt, $\frac{1}{4}$ teaspoonful pepper, $\frac{1}{2}$ cup bread crumbs. Put a layer of bowfin in a buttered baking dish, then a layer of flour, butter, salt, and pepper, then another layer of fish, etc., until the dish is filled. Put a thick layer of bread crumbs on top and dot with butter. Bake in a moderate oven for 30 minutes.

^a Contributed by Mrs. J. V. Greene.

^b Contributed by Mrs. Templeton van de Bogert.

^c Contributed by Mrs. A. F. Shira.

Molded fish with Normandy sauce.— $1\frac{1}{2}$ cups finely shredded fish, whites of 2 eggs, $1\frac{1}{4}$ cups cream, pepper to taste, cayenne to taste. Mix the ingredients in the order given, turn into a buttered fish mold or baking dish, cover with buttered paper, set in pan of hot water and bake until fish is firm. Turn on serving dish and serve with sauce.

Normandy sauce: Cook a little fish with three slices of carrots, one slice onion, sprig of parsley, a bay leaf, $\frac{1}{4}$ teaspoonful peppercorns, and 2 cups water; allow to cook for 30 minutes, then strain. There should be one cup of liquid. Melt 2 tablespoonfuls butter, add 3 tablespoonfuls flour, 1 cup fish stock, $\frac{1}{2}$ cup cream, and yolks of 2 eggs. Season with salt, pepper, and cayenne.

Toasted bowfin.—Place long, thin strips of bowfin on a greased wire broiler and broil until brown on one side. Remove to serving dish and spread with butter.

Potato fish balls.—One cup shredded bowfin; 2 heaping cups potatoes, diced; 1 egg, well beaten; $\frac{1}{2}$ tablespoonful butter; $\frac{1}{2}$ teaspoonful pepper; $\frac{1}{2}$ teaspoonful salt. Cook fish and diced potatoes in boiling water until potatoes are soft. Drain through strainer, return to kettle in which they were cooked, and mash thoroughly. Add butter, well-beaten egg, and pepper. Beat well, and add salt. Fry, by spoonfuls, for one minute in deep fat. Drain on brown paper and serve hot with or without tomato or egg sauce.

Potato fish hash.—One cup shredded fish, 2 heaping cups diced potatoes, $\frac{1}{2}$ tablespoonful butter, $\frac{1}{2}$ teaspoonful pepper, $\frac{1}{2}$ teaspoonful salt. Boil fish and potatoes together until done. Drain through strainer, return to cooking kettle, and mash thoroughly. Try out salt pork in a frying pan, remove scraps, leaving enough fat to moisten potatoes and fish. Put in fish and potatoes, stir till heated, then cook over a slow fire till well browned underneath. Fold and turn like omelet.

Fish box.—Line a buttered bread pan or baking dish with warmed steamed rice. Fill the center with cold, boiled, flaked fish and season with salt, pepper, and a little nutmeg. Cover it with rice and pour over it fish stock to within an inch of the top of the pan. Butter the top layer of rice and bake 1 hour. Turn on platter and serve with cream sauce or tomato sauce.

Fish sandwiches.—Mix flaked boiled fish with enough mayonnaise to moisten it, add chopped celery, season and spread between slices of buttered rye bread.

LIST OF ECONOMIC CIRCULARS ON FISH AS FOOD.

These circulars are sent free on application. Order by number from Division F, United States Bureau of Fisheries, Washington, D. C.

11. Canned salmon: Cheaper than meats and why; including 50 tested recipes.
12. Sea mussels: What they are and how to cook them; with 18 recipes.
13. Commercial possibilities of the goosefish: A neglected food; with 10 recipes.
18. Oysters: The food that has not "gone up." A little of their history and how to cook them.
19. The tilefish: A new deep-sea food fish.
20. Caviar: What it is and how to prepare it.
22. The grayfish. Try it. It knocks H out of the H. C. of L.
23. The sablefish, alias black cod. An introduction to one of the best and richest of American food fishes, with recipes for cooking it.
25. The burbot: A fresh-water cousin to the cod.
26. The bowfin: An old-fashioned fish with a new-found use. (Revised.)
27. A practical small smokehouse for fish. How to construct and operate it. (Revised.)
28. Preserving fish for domestic use.
29. Why and how to use salt and smoked fish. Sixty-one ways of cooking them.
30. Possibilities of food from fish.
31. The carp: A valuable food resource; with 23 recipes.
32. The whiting: A good fish not adequately utilized.
33. The eulachon: A rich and delicious little fish.

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